EPA RESOURCE CONSERVATION AND RECOVERY ACT

RECORD OF DECISION

FACILITY NAME AND LOCATION

International Business Machines Corporation
9500 Godwin Drive
Manassas, Virginia

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected Corrective Measure for the International Business Machines (IBM) Facility in Manassas, Virginia. This decision is based on the Administrative Record file for this facility.

ASSESSMENT OF THE FACILITY

Implementation of the selected Corrective Measure is necessary to protect human health or the environment from releases of hazardous waste from the IBM Facility.

DESCRIPTION OF THE CORRECTIVE MEASURE

This action addresses onsite and offsite groundwater contamination as well as onsite source remediation.

The major components of the selected Corrective Measure are:

- in-situ vacuum extraction of soil and bedrock contaminated with tetrachloroethylene;

- pumping and treating of groundwater via four (4) recovery wells; two of these wells are located at the facility while the remaining two recovery wells are located beyond the facility boundary.

DECLARATION

The selected Corrective Measure is necessary to protect human health or the environment from releases of hazardous waste within the meaning of Section 3008(h) of RCRA, 42 USC Section 6928(h), from the IBM facility to the environment. The selected Corrective Measure will attain media cleanup standards, will reduce or eliminate to the maximum extent possible further

releases of hazardous waste, and provides for proper management of wastes generated during implementation of the Corrective Measure. In addition, the selected Corrective Measure will be effective and reliable, both in the long term and short term, will result in the reduction of toxicity, mobility or volume of hazardous waste, is implementable and is cost-effective in comparison to other corrective measure alternatives. Finally, the selected Corrective Measure utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

EDWIN B. ERICKSON
REGIONAL ADMINISTRATOR
U.S. EPA, REGION III

JUL 25 1990
DATE

EPA RESOURCE CONSERVATION AND RECOVERY ACT

RECORD OF DECISION

Purpose of EPA's Record of Decision

On March 1, 1989, the United States Environmental Protection Agency (EPA) and International Business Machines (IBM) Corporation entered into a Consent Order pursuant to Section 3008(h) of the Resource Conservation and Recovery Act (RCRA). Under the terms of this Consent Order, IBM was required to complete an onsite and offsite investigation of the nature and extent of releases of hazardous waste from its Manassas, Virginia facility (the "Facility") and to conduct a study which evaluated various cleanup alternatives.

IBM completed these investigations and submitted to EPA for approval a Corrective Measures Study (CMS) which evaluates four (4) Corrective Measure Alternatives (CMAs) for contamination remediation. EPA approved the CMS Report on March 8, 1990.

A Public Notice soliciting public comment regarding EPA's preliminary identification of CMA #4 as the preferred Corrective Measure appeared in the Washington Post on Wednesday, March 21, 1990, and in the Springfield Journal Messenger on Wednesday, March 29, 1990. Two separate comment letters were received by EPA. These comment letters did not challenge EPA's selection of CMA #4. Rather, the letters addressed topics deemed by EPA to be tangential to the selection of CMA #4 as the preferred Corrective Measure. EPA's response to the two comment letters is provided in the Response to Comments section of this Record of Decision (ROD).

The Regional Administrator, EPA Region III, has made a final determination selecting CMA #4 as the Corrective Measure to be implemented by IBM. This ROD presents EPA's justification for the selection of CMA #4.

Background

The IBM Manassas Facility is located in north central Virginia, approximately 25 miles southwest of Washington, DC. The 600-acre facility is located at 9500 Godwin Drive in the City of Manassas, Prince William County, Virginia.

IBM began operations at the Facility in 1969. The principal activities at the Facility are semiconductor design and the manufacturing and development of electronic defense systems. The principal chemicals utilized by IBM in its manufacturing activities are: 1,1,1-trichloroethane, Freon 113, ethylene glycol, tetrachloroethylene, sodium hydroxide, xylene (mixed isomers) and sulfuric acid. The Facility buildings north of Wellington Road (Buildings 101 and 102) were the original manufacturing buildings, but were completely converted to offices in the mid to late 1970's. The current manufacturing buildings (105, 110, 120, and 130) and the support facilities, including chemical handling and storage buildings (010 and 216), the utility plant (200), and the industrial wastewater treatment plant (210), are located in the main area of the Facility between Godwin Drive and Nokesville Road in the City of Manassas. A Facility map showing the location of these buildings is provided as Attachment A.

In 1978, IBM began an investigation of the Manassas Facility to determine whether soils and/or groundwater had been impacted by activities at the Facility. The initial investigations (which are summarized in the Plan of Study, Volume 1, Section 7.A, dated April 4, 1986) showed elevated levels of volatile organic compounds (VOCs), primarily tetrachloroethylene (also known as perchloroethylene (PCE)), trichloroethylene (TCE), trans 1,2-dichloroethylene (trans 1,2-DCE), and 1,1,1-trichloroethane (1,1,1-TCA), in onsite soils and/or groundwater. The concentrations of VOCs in onsite soils ranged from levels that could not be detected to tens of parts per million (ppm), while the concentrations of VOCs in groundwater ranged from levels that could not be detected to approximately 10 ppm. 1,1,1-TCA was only detected in groundwater, not soil, at the Facility.

As a result of these initial investigations, IBM installed 49 onsite wells and 45 offsite wells to monitor groundwater. The locations of onsite and offsite monitoring wells are provided as Attachments B(1) and B(2), respectively. Additionally, IBM implemented several onsite remedial actions including: a soil treatment program to raise the pH in contaminated soils and immobilize fluoride in soil near Buildings 110 and 200; soil excavation and waste tank removal near Building 200 for one (1) 10,000-gallon waste solvent tank and two (2) 20,000 gallon waste acid tanks in which the tanks and approximately 1,227 tons of soil were disposed of in an EPA-approved hazardous waste landfill; closure of a waste solvent pipe from Building 110 to the former underground solvent waste tank near Building 200; closure of an underground spill tank and associated appurtenances located near Building 110; closure of an underground concrete tank located outside Building 115; and pumping and treating of groundwater recovered from onsite groundwater wells D-28 and D-29.

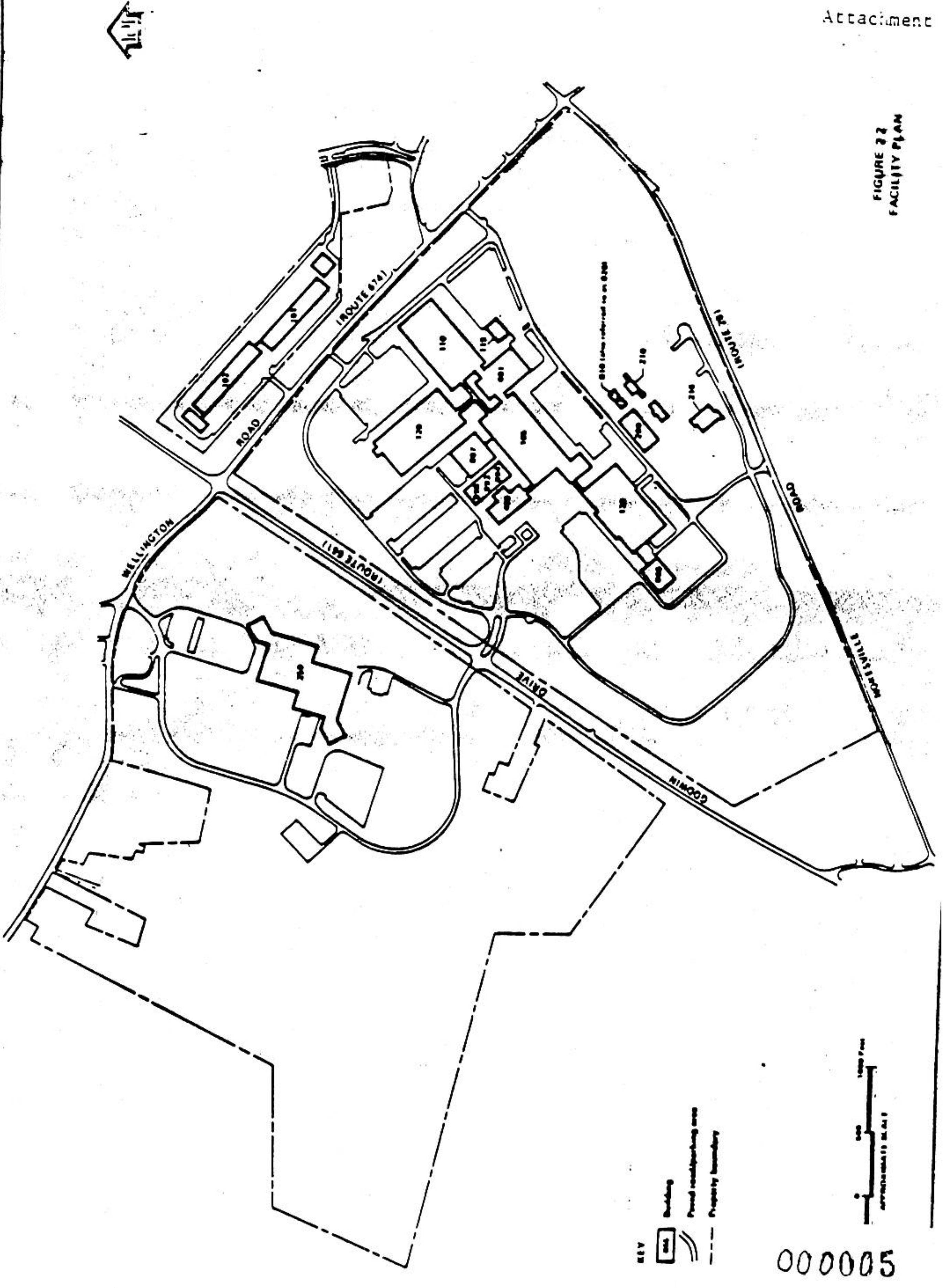
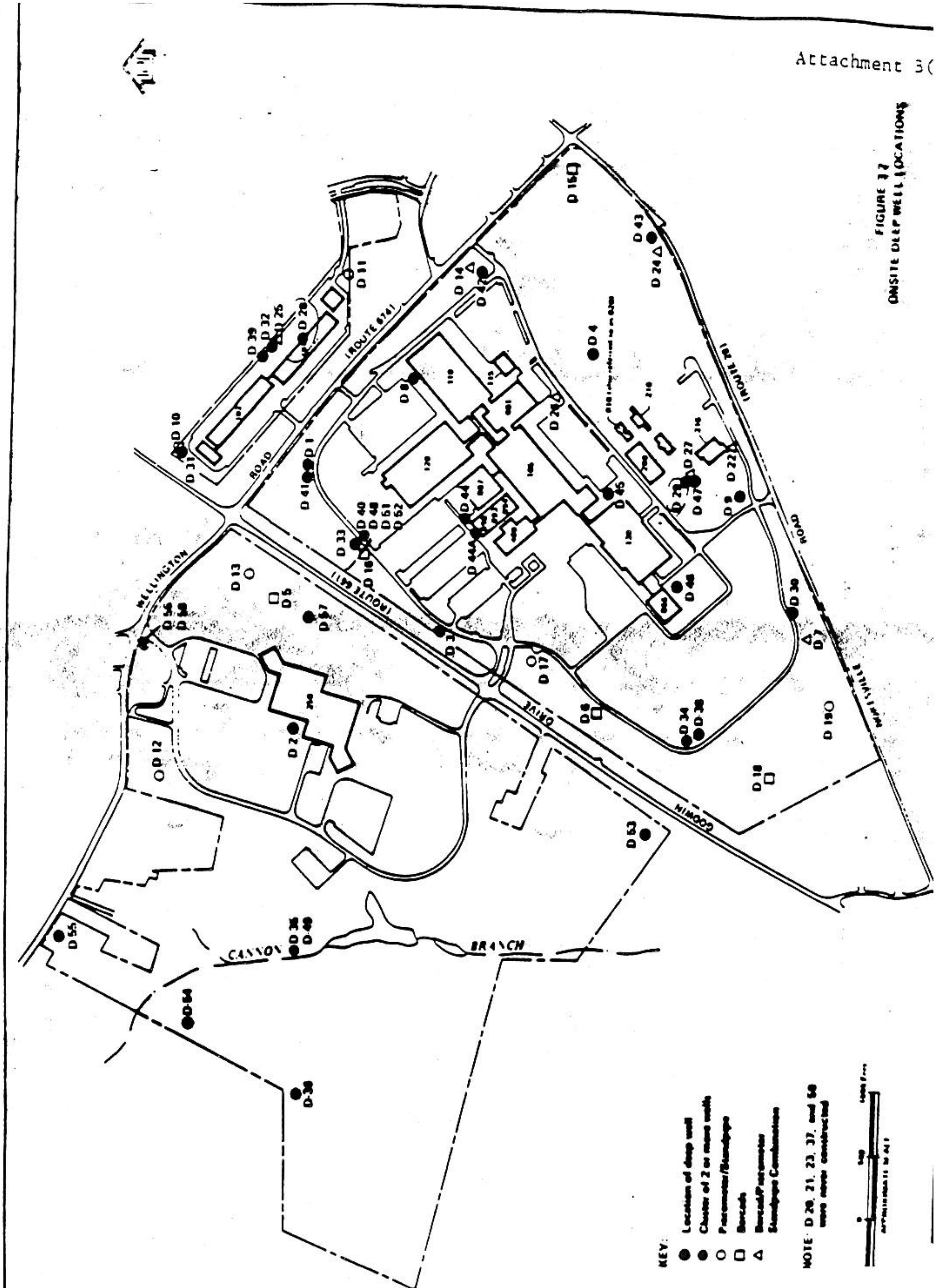


FIGURE 2 2
FACILITY PLAN

000005


ONSITE DEEP WELL LOCATIONS
WELLINGTON
ROAD
(ROUTE 674)
(ROUTE 641)
GODWIN
DRIVE
ROAD
CANNON
BRANCH
KEY:
NOTE: D 20, 21, 23, 37, and 50 were never constructed

000006

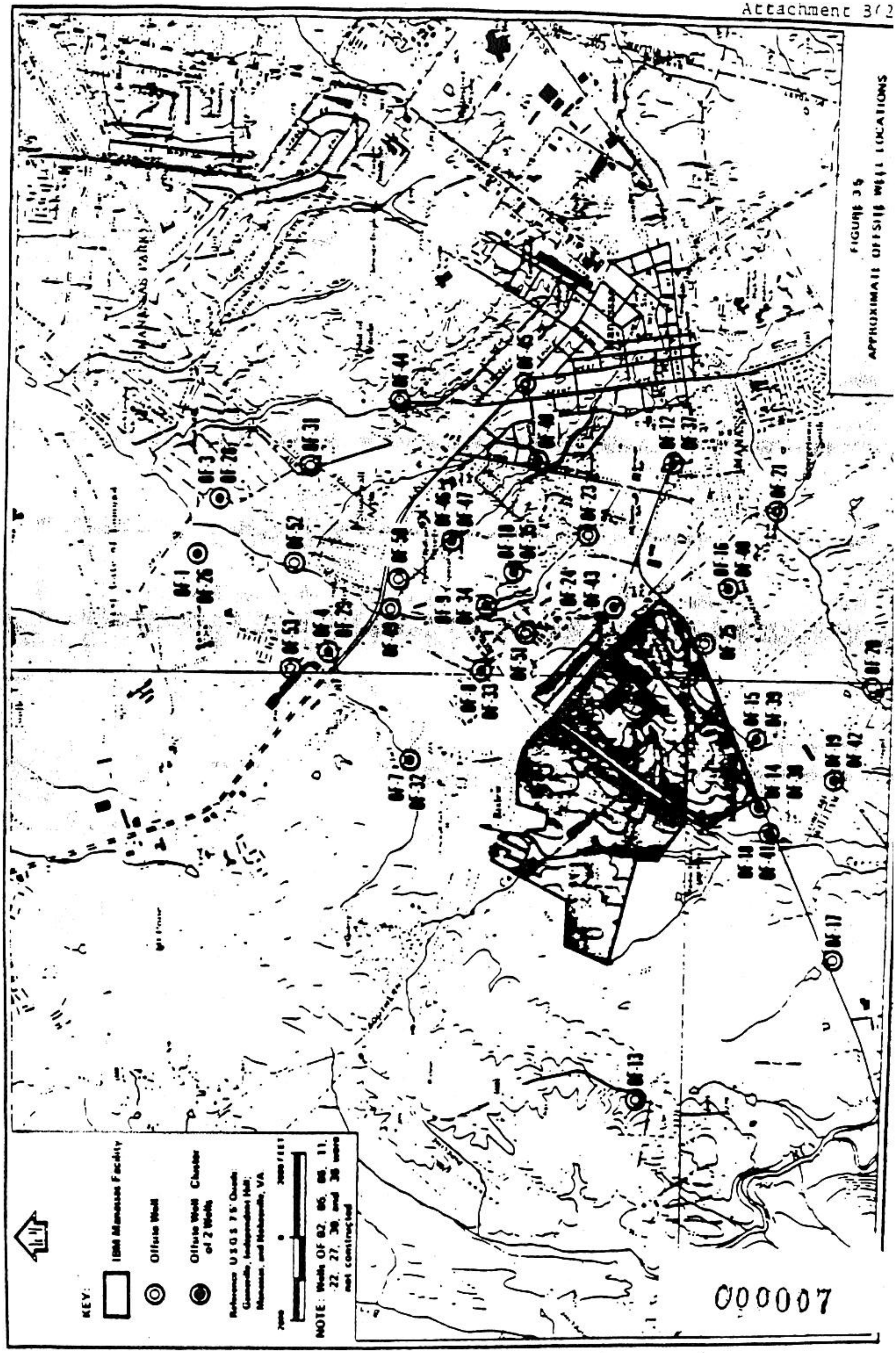


FIGURE 35
APPROXIMATE OFFSITE WELL LOCATIONS
KEY:
IBM Manassas Facility
Offsite Well
Offsite Well Cluster of 2 Wells
Reference USGS 7.5' Quads
NOTE: Wells OF 02, 05, 06, 11, 22, 27, 30, and 38 were not constructed
MANASSAS PARK
MANASSAS
OF 44
OF 45
OF 31
OF 52
OF 53
OF 13
OF 17
000007

IBM also conducted sampling and analysis of public as well as private drinking water wells. IBM provided city (Manassas) water hookups to replace five (5) private water supply wells where hazardous wastes associated with IBM (principally PCE) were detected, and assisted the Prince William County Service Authority in installing and monitoring a groundwater treatment system for its public supply well (identified as PW-07), in which the concentration of PCE exceeded the Prince William County Health District drinking water action limit of 3.5 parts per billion (ppb).

The results of the various environmental investigations conducted by IBM from 1978 to 1988 showed that:

1) the IBM Manassas Facility is underlain by a single bedrock aquifer consisting of interbeded red siltstone and sandstone. The bedrock aquifer is unconfined, heterogeneous and anisotropic;

2) the direction of groundwater flow and consequent movement of VOCs from the IBM Facility is toward the northeast;

3) the principal source of VOCs which have impacted soil and groundwater is located near Building 101, while the secondary source of VOCs is located in the vicinity of Buildings 110 and 200;

4) the maximum concentration of VOCs in ground water is approximately 10 ppm and is located near Building 101; and

5) the Occoquan Reservoir is approximately five (5) miles west of the IBM Manassas Facility. The reservoir is hydraulicaly upgradient of the Facility. Therefore, no contaminants emanating from the Facility discharge to the reservoir.

Two (2) maps which illustrate the extent of groundwater contamination are provided as Attachment C. (Additional information regarding the characterization and distribution of VOCs in the groundwater may be found in the Sampling, Analysis and Monitoring Report, dated June 28, 1988).

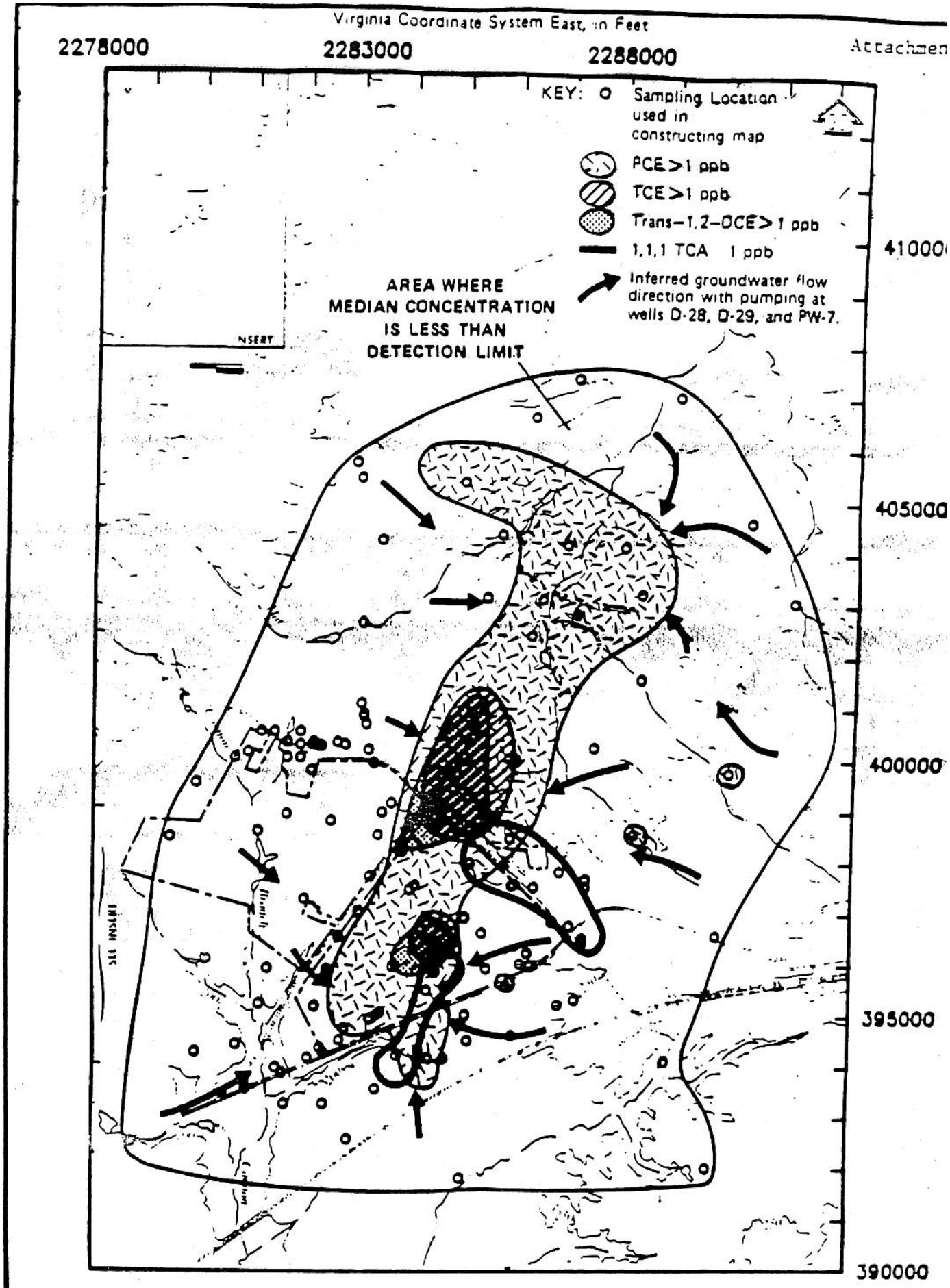


FIGURE 7-1
OCCURRENCE OF VOCs IN GROUNDWATER AT DEPTHS LESS THAN 256 FEET

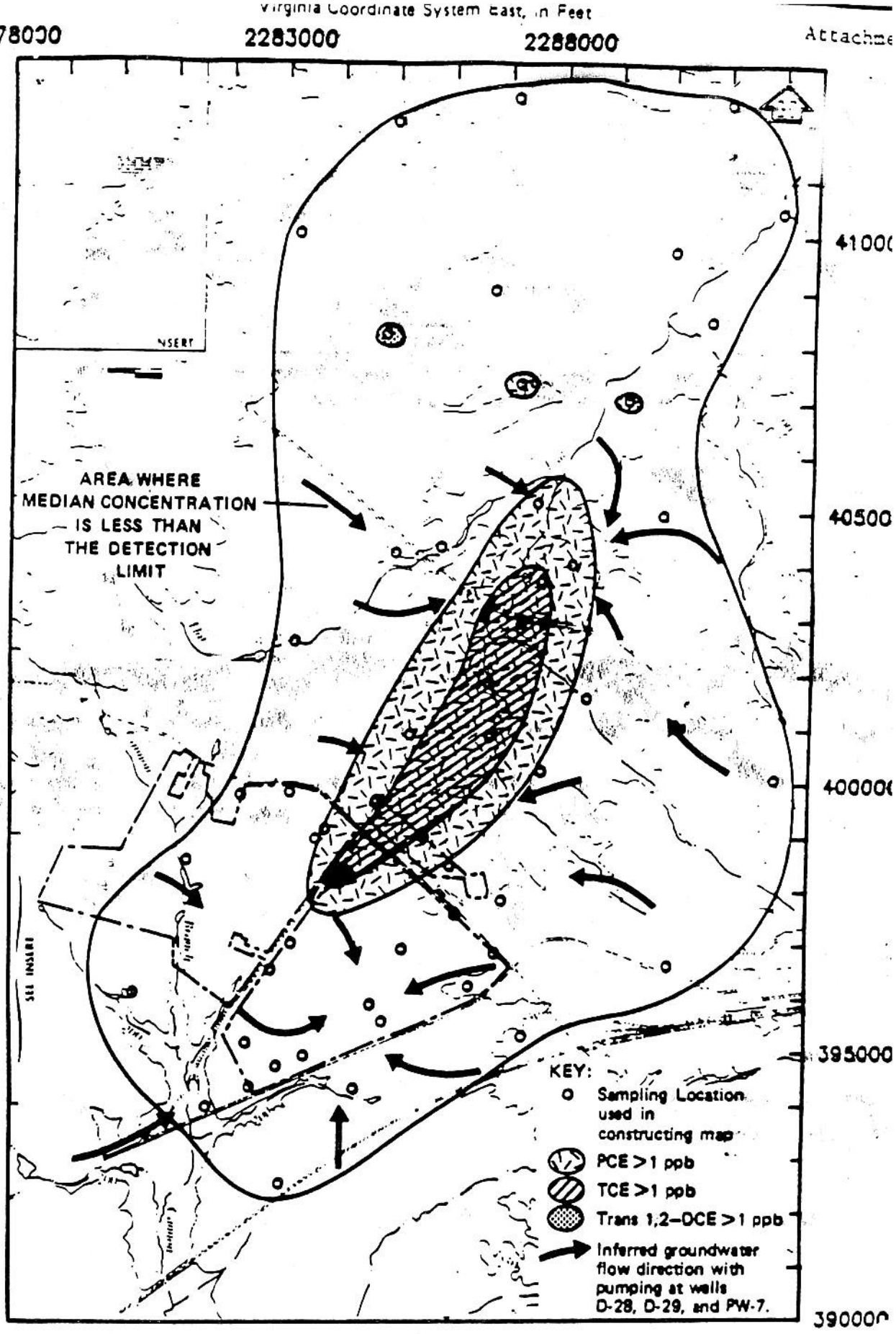


FIGURE 7-2
OCCURRENCE OF VOCs IN GROUNDWATER
AT DEPTHS MORE THAN 256 FEET

000010

In December 1984, EPA proposed the IBM Manassas Facility for inclusion on the Superfund National Priorities List (NPL). At that time, facilities placed on the NPL were to be addressed under EPA's authorities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, otherwise known as Superfund), 42 U.S.C. 9601 et seq. However, also in 1984, the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901 et seq., was amended to allow EPA to address contamination at hazardous waste facilities under RCRA authorities. Additionally, on June 24, 1988, EPA finalized the RCRA/NPL Listing Policy, which further defined EPA's ability to address NPL sites under RCRA. Because of these revisions to the RCRA statute and policy, EPA made the decision to address IBM's Manassas Facility using RCRA authorities.

On March 1, 1989, EPA and IBM entered into a Consent Order pursuant to Section 3008(h) of RCRA. Under the terms of this Consent Order, IBM was required to complete its onsite and offsite investigation of the nature and extent of the contamination from the Manassas Facility and conduct a study which evaluated various cleanup alternatives (the Corrective Measures Study (CMS)). The requirements of the Consent Order were satisified with EPA's approval of the CMS Report on March 8, 1990.

Description of the Corrective Measure Alternatives

In its CMS Report, IBM evaluated four (4) Corrective Measure Alternatives (CMAs). These four (4) alternatives are discussed in more detail below.

CMA-1: The components of CMA-1 are the continuation of pumping and treatment systems for two (2) onsite groundwater recovery wells (D-28 and D-29) and one (1) offsite groundwater recovery well (Prince William County Service Authority public water supply well PW-07); continued usage of granular activated carbon (GAC) treatment units at each recovery well; groundwater monitoring at 49 onsite and 45 offsite monitoring wells; provisions for monitoring and, if necessary, treatment of private and/or public wells; and maintaining a community relations plan.

CMA-2: The components of CMA-2 include all the provisions specified in CMA-1 as well as the installation of a second offsite recovery well, OF-34, and associated groundwater treatment system consisting of granular activated carbon filtration tanks. Therefore, in CMA-2, a total of four (4) recovery wells have been proposed: wells D-28, D-29, OF-34, and PW-07.

CMA-3: The components of CMA-3 include all the provisions specified in CMA-1 with the addition of an onsite pilot vapor extraction system near Building 101, and associated gas-phase treatment and monitoring system for the unsaturated zone. The workplan for a pilot vapor extraction system was approved by EPA on October 12, 1989, and, consequently, the pilot vapor extraction system is currently operating. In CMA-3, only wells D-28, D-29, and PW-07 are proposed for pumping and treating of groundwater.

CMA-4: The components of CMA-4 include all the provisions specified in CMA-1, CMA-2, and CMA-3. In CMA-4, four (4) recovery wells are proposed; wells D-28, D-29, OF-34, and PW-07 as well as the onsite vapor extraction system described in CMA-3.

A summary table of the Corrective Measure Alternatives is provided as Attachment D.

Although all four CMAs are protective of human health and the environment, EPA has selected CMA #4 as the final Corrective Measure at the IBM Manassas Facility. The remainder of this ROD presents EPA's rationale for this selection.

EPA's Rationale for Selecting CMA #4

A. Cleanup Goals/Points of Compliance for CMA #4

Cleanup goals were established for CMA #4 in order to determine when groundwater remediation has been completed. For the IBM Manassas Facility, cleanup goals were established that were either Maximum Contaminant Levels (MCLs) or 10-6 cancer risk-based levels. MCLs are federally enforceable drinking water standards developed under the Safe Drinking Water Act which are published at 40 C.F.R. Part 141, Subpart B. The 10-6 cancer risk-based level represents the concentration of a carcinogen such that a person of average weight drinking 2 liters/day of water containing 0.67 microgram/liter of the contaminant would have no more than a 1 in 1 million chance of developing cancer from drinking the water during a 70 year lifespan.

When establishing cleanup goals, it is also necessary to establish where (i.e., in which groundwater monitoring wells or recovery wells) these goals will be measured. The following table lists the points of compliance and the respective cleanup goals for CMA #4.

Table 3-1

SUMMARY OF CORRECTIVE MEASURE ALTERNATIVES IDENTIFIED FOR EVALUATION

CORRECTIVE MEASURE ALTERNATIVE IDENTIFICATION	PRINCIPAL COMPONENTS OF CORRECTIVE MEASURE ALTERNATIVE				
	ONGOING PUMPING AND TREATMENT SYSTEM (a)	PROVISION OF ALTERNATE WATER SUPPLIES	COMMUNITY RELATIONS ACTIVITIES	ADDITIONAL OFFSITE PUMPING AND TREATMENT SYSTEM (b)	ONSITE VAPOR EXTRACTIO SYSTEM (c)
CMA-1	X	X	X		
CMA-2	X	X	X	X	
CMA-3	X	X	X		X
CMA-4	X	X	X	X	X

Notes:

(a) Pumping and treatment systems located at D-28, D-29 and PW-07.

(b) Pumping and treatment system located offsite approximately midway between D-28 and PW-07.

(c) Onsite vapor extraction system near Building 101.

Cleanup Goals for Contaminated Groundwater
(concentrations expressed in ppb) Point of Compliance

(Recovery Well)	PCE	TCE	trans 1,2 - DCE*	1,1,1 - TCA*
D-28	5	5	70	200
D-29	5	5	70	200
OF-34	5**	5**	70	200
PW-07	0.67***	3***	70	200

NOTE: All cleanup goals represent established or proposed MCLs unless otherwise indicated.

* These compounds are toxic to the body but they do not induce cancer.

** If this well is ever used as a public drinking water supply well, the 10-6 cancer risk-based level must be met.

*** These cleanup goals represent the 10-6 cancer risk-based level.

EPA acknowledges that, due to the high concentrations of VOCs in the groundwater at and extending approximately 1000 feet northeast of Building 101, and the kinetics of chemical and physical desorption of contaminants in soils and groundwater, not only near Building 101 but also at Buildings 110 and 200, it may be technically impossible to attain the cleanup goals at wells D-28, D-29, OF-34 and PW-07. It is quite possible that concentrations of VOCs in the groundwater may reach a level at which, regardless of the pumping and treatment that is undertaken and the length of time pumping and treatment is implemented, an equilibrium concentration of VOCs in the groundwater is attained. This equilibrium concentration may exceed the required cleanup goal. To account for this possibility, EPA has provided IBM the opportunity to petition EPA to modify the cleanup goals in the following instances:

1. IBM may petition EPA to revise the cleanup goals at groundwater monitoring wells D-28, D-29 and OF-34 based on a statistical analysis, as provided in the Clarifications and Amendment to the Corrective Measure Study Report Supplement, of analytical data from these wells during a ten (10) consecutive year period. If this statistical analysis shows that an equilibrium concentration has been reached, whereby the concentration of contaminants in the groundwater measured at wells D-28, D-29 and OF-34 are statistically constant for ten (10) consecutive years, IBM may request that EPA establish a final cleanup level based on this equilibrium concentration. EPA and IBM acknowledge that this final cleanup level may be less stringent than an MCL.

2. IBM may petition EPA to revise the cleanup goal at well D-28 based on an analysis of its impact upon wells OF-34 and PW-07. If IBM can demonstrate to EPA's satisfaction that, after ten (10) consecutive years of pumping and treating, a given concentration of contaminants in groundwater at well D-28 in excess of the MCL, will not result in an unacceptable health risk, as determined by EPA, for contaminant concentrations in wells OF-34 and PW-07, EPA may establish final cleanup levels at well D-28 that may be less stringent than the MCL. However, groundwater consumed from PW-07 would have to be treated to a 10-6 risk level.

3. IBM may petition EPA to revise the cleanup goals at well PW-07 based upon a statistical analysis, as provided in the Clarifications and Amendment to the Corrective Measure Study Report Supplement, of analytical data from this well during a ten (10) consecutive year period. If this statistical analysis shows that an equilibrium concentration has been reached, whereby the concentration of contaminants in the groundwater measured at well PW-07 is constant for ten (10) consecutive years, IBM may request that EPA establish a final cleanup level based on this equilibrium concentration. However, if an equilibrium concentration exceeds an acceptable health risk for PCE, as determined by EPA at well PW-07, then IBM must assure that groundwater will continue to be

treated and will not exceed a 10-6 health risk level as is currently being provided by the two granular activated carbon units.

4. If, at some point in the future, groundwater from well OF-34 is used as a drinking water source, an acceptable health risk, as determined by EPA, no less stringent than an MCL, would apply at well OF-34. The final cleanup level and subsequent groundwater treatment requirements for well OF-34 would be analogous to those for well PW-07 as delineated in paragraph 3, above.

5. IBM may also petition EPA to determine that the corrective measure for well PW-07 has been completed based on a demonstration by IBM that the PCE at well PW-07 is no longer attributable to a release from IBM's Facility. If IBM can demonstrate to EPA's satisfaction that the PCE at well PW-07 is no longer attributable to such a release, then IBM's corrective measure at well PW-07 will be deemed to have been completed.

B. Health Risk and Length of Time Needed for Remediation:

As previously stated, due to the high VOC concentrations in the groundwater and the kinetics of desorption, it is very difficult to predict when the cleanup goals will be achieved. However, a relative comparison of the length of time needed for each CMA to achieve the health based cleanup goals (or an equilibrium concentration if applicable) can be made.

EPA has determined that all four (4) proposed CMAs are protective of human health and the environment. The risk of the groundwater contaminant plume from the Manassas Facility impacting human health and/or the environment has been greatly reduced by virtue of the ongoing pumping and treatment program, embodied in CMA-1, which has contained and is presently capturing the entire groundwater contaminant plume. However, EPA is select-ing CMA-4 since the installation of an offsite recovery well (OF-34) in conjunction with the useage of a vapor extraction system offers the most expeditious means of groundwater remediation.

CMA-4 will allow the Cleanup Goals to be attained more quickly, relative to CMA-1, CMA-2 and CMA-3, by: (1) providing remediation of the principal source area for VOCs by employing an in-situ soil/bedrock vapor extraction system, and (2) usage of an offsite recovery well, termed OF-34, which is located near the center of the groundwater contaminant plume. Usage of this well will allow the capture and therefore remediation of groundwater much faster than if PW-07 were to remain the only offsite recovery well.

C. Decision Criteria Used for Selection of CMA #4

EPA has selected CMA-4 because it represents proven technologies and is protective of human health and the environment. EPA is also confident that this corrective measure can be effectively employed to remediate the groundwater contaminant plume both within and beyond the IBM Manassas Facility boundaries.

A more detailed evaluation of CMA-4 is provided below. The evaluation is based upon the criteria of performance, reliability, implementability, health and safety, environmental, and costs.

1. Performance: The ongoing ground water pumping and treatment system at recovery wells D-28, D-29, and PW-07 is effective in containing and removing VOCs from the groundwater plume. Performance of these ongoing corrective measures should be enhanced by the addition of the onsite vapor extraction system and the additional offsite groundwater pumping/treatment system (well OF-34), which are anticipated to improve the containment of the groundwater plume and expedite the removal of VOCs from both the saturated and unsaturated zones.

2. Reliability: Operation of the existing wells (wells D-28, D-29, and PW-07) and their associated treatment systems in addition to the proposed well (OF-34) and its associated treatment system should be relatively trouble-free, and mainten-ance requirements should be routine. By reducing the ongoing pumping/treatment system's reliance on PW-07 to contain the northern end of the offsite groundwater contaminant plume, use of the additional offsite well (OF-34) should improve overall system reliability in maintaining effective plume containment and VOC removal.

Operation and maintenance requirements of the vapor extraction system appear to be relatively minor. Maintenance and supervision of the vacuum pumping operations and humidity control in the vapor discharge appear to be the principal issues of concern with the vapor extraction system. Based on the use of vapor extraction systems at other sites and the experience gained during the preliminary pilot tests at IBM's Manassas Facility, vapor extraction is considered to be a reliable technology.

3. Implementability: Installation of the new offsite recovery well (OF-34) and associated GAC treatment system should be possible without any unusual technical difficulties. Installation of the second offsite recovery well (OF-34), however, will result an additional 200 gallons per minute (gpm) of treated groundwater that IBM will need to discharge. In order to discharge this treated groundwater to a creek, stream, river or other surface water body, IBM will be required to obtain a National

Pollutant Discharge Elimination System (NPDES) permit from the Virginia State Water Control Board (VASWCB). If IBM cannot obtain an NPDES permit, it will be required to consider other disposal options for this treated groundwater.

Other issues that would need to be resolved include the acquisition of building, plumbing, and electrical permits and arrangements for purchasing property or obtaining easements for placement of the additional pumping and treatment system at OF-34.

The ongoing pilot vapor extraction project will help identify any potential problems associated with the installation and long-term operation of a full-scale vapor extraction system at the IBM Facility. An air emissions permit or a permit waiver may be required, due to the release of the extracted gas stream to the atmosphere. However, this should not be a problem because the gas stream will be treated by GAC units in order to remove VOCs prior to its release to the atmosphere. In general, no major problems are expected in implementing a vapor extraction system at IBM's Manassas Facility.

4. Health and Safety: The ongoing corrective measures are protective of public health and safety. Implementation of the additional offsite groundwater pumping well (OF-34) and the vapor extraction system in CMA-4 should enhance the protection of public health and safety by reducing the reliance on PW-07 to contain the northern extent of the offsite ground-water plume and expediting removal of VOCs from the groundwater and unsaturated zone.

The preliminary vapor extraction tests at the IBM Manassas facility in 1988 indicate that the primary health and safety concern related to the vapor extraction system involves the presence of PCE in the extracted gas stream at levels above the Immediately Dangerous to Life and Health (IDLH) level recommended by the National Institute of Occupational Safety and Health (NIOSH). Exposure of personnel operating the vapor extraction system to PCE and other VOCs in the extracted gas stream can be minimized by reducing or eliminating the need for manual collection of vapor samples by using an in-line gas chromatograph or other suitable instrument to obtain real-time chemical analysis of the gas stream.

Public health and worker safety is protected by removing VOCs from the gas stream before release to the atmosphere. The high efficiency of granular activated carbon filters used to remove VOCs from the gas stream must be maintained. Therefore, water carryover in the gas stream must be controlled by use of a fine demister at the outlet of the water-vapor separator, by passing the gas stream through a condenser or dehumidifier, or by another appropriate method.

5. **Environmental:** Operation of the existing and new groundwater pumping well (OF-34) in CMA-4 does not adversely impact the environment. The removal of VOCs from the ground-water and their subsequent destruction by incineration of the spent carbon mitigates potential adverse impacts on the environment.

The principal environmental concern associated with vapor extraction involves the possible release of VOCs to the atmosphere in the exhausted gas stream. However, given the usage of high efficiency GAC filters, the possibility of release of significant levels of VOCs to the atmosphere is very remote. Finally, by removing VOCs from the unsaturated zone before they reach the ground water, use of the vapor extraction system would be expected to accelerate the required remediation of the contaminated groundwater, thereby mitigating potential adverse impacts on the environment.

6. **Costs:** The total estimated capital and operation and maintenance costs associated with both the existing and the additional groundwater pumping well/treatment systems and the other ongoing corrective measures included in CMA-4 are $1,665,400 and $709,000/yr., respectively.

The estimated capital and operation and maintenance costs to implement and complete the pilot vapor extraction project are approximately $146,000 and $354,000, respectively. Thus, the total estimated capital cost associated with CMA-4 is $1,811,400. The first annual operation and maintenance cost estimate for CMA-4 is $1,063,700. Upon completing the pilot vapor extraction project, the operation and maintenance cost for CMA-4 reverts to $709,700. These estimates do not include any additional expenditures that may be required to continue the vapor extraction using the pilot equipment or to implement a full-scale, long-term vapor extraction system. These cost estimates are provided in more detail in the Corrective Measures Study Report, Section 4.3.2.6.

Implementation of CMA #4

EPA and IBM will begin negotiations on a second RCRA 3008(h) Consent Order requiring IBM to implement CMA #4.

RESPONSE TO COMMENTS

1. Introduction

A Public Notice soliciting public comment regarding EPA's preliminary identification of a Corrective Measure Alternative (CMA) which addresses on-site as well as off-site contamination at the IBM, Manassas, Virginia Facility appeared in the Washington Post on Wednesday, March 21, 1990, and in the Springfield Journal Messenger on Wednesday, March 28, 1990. The public comment period was effective for thirty (30) calendar days from the respective dates of the Public Notice. The documents made available for public comment were: the EPA Statement of Basis (SOB), the IBM Corrective Measure Study (CMS) Report and the IBM Sampling, Analysis and Monitoring Report. These documents were located, as stipulated in the Public Notice, at the Manassas Public Library.

EPA's technical and supervisory personnel study public comments in order to determine if EPA's preliminarily identified CMA has adequately addressed public comments. If public comments provide information or technical knowledge which clearly demonstrates that EPA's initial selection of a CMA is inapropriate, EPA may modify or select an entirely different corrective measure based, in part, upon the public comments.

II. Selected Corrective Measure Alternative:

Four CMAs (CMA #1, CMA #2, CMA #3, and CMA #4) were proposed by IBM in the CMS Report. EPA evaluated these CMAs by applying the following five selection decision factors:

1) long-term reliability and effectiveness;
2) reduction of toxicity, mobility, or volume of hazardous waste and/or hazardous constituents;
3) short-term effectiveness;
4) implementability; and
5) cost.

EPA finds that CMA #4 best satisfies these selection decision factors. Although CMA #2, #3 and #4 satisfy selection decision factors 3(short-term effectiveness), 4(implementability) and 5(cost), CMA #1 does not address, relative to CMA #4, reduction in the volume of waste at the contaminant source area near building 101. Additionally, CMA #1, CMA #2 and CMA #3 do not provide the long-term effectiveness of CMA #4. Details regarding each of these CMAs may found in the CMS Report as well as pages four (4) through ten (10) of the Record of Decision.

CMA #4 assures adequate protection of human health and the environment by:

1) rapid cleanup of contaminants;
2) no significant release of contaminants to the atmosphere or surface water from cleanups operations and
3) the cleanup of groundwater at the points of compliance to the levels specified on page five (5) of the ROD.

III. Public concerns prior and during the comment period:

No concerns were raised prior and during the comment period. EPA received two comment letters during the comment period. These letters were from Mr. Christian Anspach of Manassas, Virginia and Mr. David Gunnarson of IBM's General Technology Division. Mr. Anspach's concerns were related to the siting of a groundwater treatment unit for recovery well OF-34. He stated that this treatment unit would:

1) have an adverse impact on property values;
2) disrupt the woodland in which the unit would be located;
3) have an adverse impact on public safety.

Mr. Gunnarson of IBM expressed the following concerns:

1) the inclusion of 1,1,1,-trichloroethane (TCA) as a compound for which IBM will be responsible for meeting a cleanup goal is not correct and should not be included in the table of cleanup goals for contaminated groundwater as provided in the SOB.

IV. Response to public concern:

The two comment letters received by EPA, as discussed in paragraph III above, do not dispute EPA's proposed selection of CMA #4. In regard to Mr. Anspach's comments concerning the siting of a groundwater treatment unit, EPA's SOB did not address this issue since the Agency has no jurisdiction regarding local siting issues. However, EPA has discussed Mr. Anspach's concerns with IBM. IBM has stated that it is aware of citizen concerns regarding siting of the treatment system. Consequently, IBM intends to provide alternative concept drawings for review by local residents and to solicit their comments. IBM has stated that solicitation of comments would preceed formal applications for construction permits.

In regard to IBM's comment, EPA agrees with IBM that 1,1,1-TCA did not likely originate from a release of 1,1,1-TCA from its Facility. This conclusion is based upon groundwater isoconcentration maps in the vicinity of on-site pumping wells D-28 and D-29. However, 1,1,1-TCA exists within the IBM Facility boundaries because of IBM's pumping of recovery wells D-28 and D-29. These wells have modified the "before pumping" direction of groundwater flow and therefore have caused the migration of 1,1,1-TCA onto IBM property.

EPA understands that the IBM Facility may not be the source of 1,1,1-TCA which exists beyond its property boundary. However, once 1,1,1-TCA is within the IBM Facility boundaries, IBM is responsible for remediation of that contaminant, regardless of its source, since IBM's recovery wells are the cause of the migration of 1,1,1-TCA onto the property. IBM has the option of installing groundwater barriers to prevent the migration of 1,1,1-TCA as a compound for which IBM will be responsible for meeting a cleanup goal. Consequently, EPA will maintain its inclusion of 1,1,1-TCA as a compound for which IBM will be responsible for meeting a cleaup goal.

V. Declarations:

EPA hereby declares Corrective Measure Alternative #4 as provided in the EPA approved CMS Report as the selected Corrective Measure. This Corrective Measure is not only highly protective of human health and the environment, but also provides a method for rapid remediation of groundwater contaminants.